

IN THE CLAIMS

1. (Original) A data conversion apparatus which is used as a data transmitting apparatus in a data communication system, wherein the data communication system achieves pseudo interactive communications by using one-way communications between the data transmitting apparatus and a plurality of data receiving apparatuses, the data conversion apparatus comprising: document storing means for storing a plurality of documents each of which includes at least a character string and at least a piece of image information, wherein at least one of the character string and the piece of image information includes a piece of link destination information which specifies another document as a link destination;

supplementary design storing means for storing a list of supplementary designs with serial numbers respectively related to the supplementary designs;

display image element generating means for reading the character string and the piece of image information one at a time from the document storing means and converting the character string and the piece of image information into respective display image elements, wherein the display image elements are bit-mapped graphics;

display image generating means for generating a display image which is composed of the display image elements, wherein the display image has a size which is equivalent to a size of display screens of the plurality of data receiving apparatuses;

supplementary design adding means for reading a supplementary design corresponding to the piece of link destination information specifying the other document as the link destination from the supplementary design storing means and adding the supplementary design to a corresponding display image element in the display image; and

display link destination information converting means for converting the piece of link destination information specifying the other document as the link destination into a piece of display link destination information, the piece of display link destination information being related to a serial number corresponding to the supplementary design added by the supplementary design adding means, wherein the piece of display link destination information

specifies, as a link destination, another display image which is a display image of the other document generated by the display image generating means.

2. (Original) The data conversion apparatus of claim 1, wherein

the display image element generating means includes:

a conversion table storing unit for storing a character size of the character string; and

a display image element generating unit for converting the character string into a display image element according to the character size and converting the piece of image information into a display image element.

3. (Original) The data conversion apparatus of claim 2, wherein

the conversion table storing unit further stores respective starting positions in a horizontal direction of the display image elements, wherein

the display image generating means includes:

a display position calculating unit for reading the starting positions of the display image elements and calculating respective display positions of the display image elements in the display image; and

a display image generating unit for generating the display image by arranging the display image elements in the display image according to the display positions.

4. (Original) The data conversion apparatus of claim 3, wherein

the display image generating unit generates a plurality of display sub-images from the document, wherein

the display link destination information converting means includes:

a display link destination information generating unit for generating a plurality sets of pieces of display link destination information which respectively correspond to the plurality of display sub-images generated from the document.

5. (Original) The data conversion apparatus of claim 4, wherein the supplementary design storing means includes:

a maximum number storing unit for storing a maximum number of the supplementary designs in the display image, wherein

the display image generating means further includes:

a maximum number judging unit for judging whether the number of the supplementary designs to be arranged in the display image exceeds the maximum number; and

a display image dividing unit for, when the maximum number judging unit judges that the number of the supplementary designs exceeds the maximum number, sending an instruction to the display image generating unit to divide the display image into the plurality of display sub-images so that supplementary designs less than the maximum number are added to each of the plurality of display sub-images divided from the display image, wherein the display image generating unit generates the plurality of display sub-images according to the instruction.

6. (Original) The data conversion apparatus of claim 5, wherein

the display link destination converting means further includes:

a display link destination sub-information generating unit for generating a plurality sets of pieces of display link destination sub-information which respectively correspond to the plurality of display sub-images generated by the display image generating unit.

7. (Original) The data conversion apparatus of claim 6 further comprising:

information obtaining means for obtaining, via a communication line, a document written in HTML (Hyper Text Markup Language) which includes at least a character string and at least a piece of image information; and

information writing means for writing the document written in HTML into the document storing means.

8. (Original) The data conversion apparatus of claim 7 further comprising:

first storing means for storing a plurality of video frames which, each having an identifier, are the display image and the plurality of display sub-images;

second storing means for storing a plurality sets of pieces of display link destination information which are generated by the display link destination information converting means and are respectively related to the plurality of video frames, wherein each of the plurality sets of pieces of display link destination information having the same identifier as the identifier of a corresponding video frame; and

broadcasting means for cyclically transmitting a certain number of video frames in the first storing means and corresponding sets of pieces of display link destination information in the second storing means.

9. (Original) The data conversion apparatus of claim 4, wherein

the display image generating unit generates the plurality of display sub-images so that each of the plurality of display sub-images includes display image elements of a same category.

10. (Original) The data conversion apparatus of claim 9, wherein

the document is written in HTML, wherein

the display image generating unit determines categories of the display image elements from tags written in the document.

11. (Original) The data conversion apparatus of claim 10, wherein the supplementary design storing means includes:

a maximum number storing unit for storing a maximum number of the supplementary designs in the display image, wherein

the display image generating means further includes:

a maximum number judging unit for judging whether the number of the supplementary designs to be arranged in the display image exceeds the maximum number; and

a display image dividing unit for, when the maximum number judging unit judges that the number of the supplementary designs exceeds the maximum number, sending an instruction to the display image generating unit to divide the display image into the plurality of display sub-images so that supplementary designs less than the maximum number are added to each of the plurality of display sub-images divided from the display image, wherein the display image generating unit generates the plurality of display sub-images according to the instruction.

12. (Original) The data conversion apparatus of claim 11, wherein

the display link destination converting means further includes:

a display link destination sub-information generating unit for generating a plurality sets of pieces of display link destination sub-information which respectively correspond to the plurality of display sub-images generated by the display image generating unit.

13. (Original) A data conversion apparatus which is used as a data transmitting apparatus in a data communication system, wherein the data communication system achieves pseudo interactive communications by using one-way communications between the data transmitting apparatus and a plurality of data receiving apparatuses, the data conversion apparatus comprising:

document storing means for storing a plurality of documents each of which includes at least a character string, wherein at least a character string includes a piece of link destination information which specifies another document as a link destination,

supplementary design storing means for storing a list of supplementary designs with serial numbers respectively related to the supplementary designs;

display image element generating means for reading the character string from the document storing means and converting the character string into a display image element, wherein the display image element is a bit-mapped graphic;

display image generating means for generating a display image which is composed of the display image element, wherein the display image has a size which is equivalent to a size of display screens of the plurality of data receiving apparatuses;

supplementary design adding means for reading a supplementary design corresponding to the piece of link destination information specifying the other document as the link destination from the supplementary design storing means and adding the supplementary design to a corresponding display image element in the display image; and

display link destination information converting means for converting the piece of link destination information specifying the other document as the link destination into a piece of display link destination information, the piece of display link destination information being related to a serial number corresponding to the supplementary design added by the supplementary design adding means, wherein the piece of display link destination information specifies, as a link destination, another display image which is a display image of the other document generated by the display image generating means.

14. (Original) The data conversion apparatus of claim 13, wherein

the display image element generating means includes:

a conversion table storing unit for storing a character size of the character string; and

a display image element generating unit for converting the character string into a display image element according to the character size.

15. (Original) The data conversion apparatus of claim 14, wherein

the conversion table storing unit further stores a starting position in a horizontal direction of the display image element, wherein

the display image generating means includes:

a display position calculating unit for reading the starting position of the display image element and calculating a display position of the display image element in the display image; and

a display image generating unit for generating the display image by arranging the display image element in the display image according to the display position.

16. (Original) The data conversion apparatus of claim 15, wherein

the display image generating unit generates a plurality of display sub-images from the document, wherein

the display link destination information converting means includes:

a display link destination information generating unit for generating a plurality sets of pieces of display link destination information which respectively correspond to the plurality of display sub-images generated from the document.

17. (Original) The data conversion apparatus of claim 16, wherein the supplementary design storing means includes:

a maximum number storing unit for storing a maximum number of the supplementary designs in the display image, wherein

the display image generating means further includes:

a maximum number judging unit for judging whether the number of the supplementary designs to be arranged in the display image exceeds the maximum number; and

a display image dividing unit for, when the maximum number judging unit judges that the number of the supplementary designs exceeds the maximum number, sending an instruction to the display image generating unit to divide the display image into the plurality of display sub-images so that supplementary designs less than the maximum number are added to

each of the plurality of display sub-images divided from the display image, wherein the display image generating unit generates the plurality of display sub-images according to the instruction.

18. (Original) The data conversion apparatus of claim 17, wherein

the display link destination converting means further includes:

a display link destination sub-information generating unit for generating a plurality sets of pieces of display link destination sub-information which respectively correspond to the plurality of display sub-images generated by the display image generating unit.

19. (Original) The data conversion apparatus of claim 18 further comprising:

information obtaining means for obtaining, via a communication line, a document written in HTML (Hyper Text Markup Language) which includes at least a character string; and

information writing means for writing the document written in HTML into the document storing means.

20. (Original) The data conversion apparatus of claim 19 further comprising:

first storing means for storing a plurality of video frames which, each having an identifier, are the display image and the plurality of display sub-images;

second storing means for storing a plurality sets of pieces of display link destination information which are generated by the display link destination information converting means and are respectively related to the plurality of video frames, wherein each of the plurality sets of pieces of display link destination information having the same identifier as the identifier of a corresponding video frame; and

broadcasting means for cyclically transmitting a certain number of video frames in the first storing means and corresponding sets of pieces of display link destination information in the second storing means.

21. (Original) The data conversion apparatus of claim 16, wherein

the display image generating unit generates the plurality of display sub-images so that each of the plurality of display sub-images includes display image elements of a same category.

22. (Original) The data conversion apparatus of claim 21, wherein the document is written in HTML, wherein

the display image generating unit determines categories of the display image elements from tags written in the document.

23. (Original) The data conversion apparatus of claim 22, wherein the supplementary design storing means includes:

a maximum number storing unit for storing a maximum number of the supplementary designs in the display image, wherein the display image generating means further includes:

a maximum number judging unit for judging whether the number of the supplementary designs to be arranged in the display image exceeds the maximum number; and

a display image dividing unit for, when the maximum number judging unit judges that the number of the supplementary designs exceeds the maximum number, sending an instruction to the display image generating unit to divide the display image into the plurality of display sub-images so that supplementary designs less than the maximum number are added to each of the plurality of display sub-images divided from the display image, wherein the display image generating unit generates the plurality of display sub-images according to the instruction.

24. (Original) The data conversion apparatus of claim 23, wherein
the display link destination converting means further includes:

a display link destination sub-information generating unit for generating a plurality sets of pieces of display link destination sub-information which respectively correspond to the plurality of display sub-images generated by the display image generating unit.

25. (Original) A data conversion system for integrating Hyper Text Markup Language (HTML) documents from a source on the Internet into a format suitable for enabling a user interaction with a video broadcast receiver comprising:

a remote controller that enables a user to interact with a video display unit; and

a data conversion apparatus for converting the HTML documents including,

document storing means for storing a plurality of HTML documents from a source on the Internet, each of the HTML documents include at least a character string and at least a piece of image information, wherein at least one of the character string and the piece of image information includes a piece of link destination information which specifies another HTML document as a link destination;

supplementary design storing means for storing a list of supplementary designs with serial numbers respectively related to the supplementary designs;

display image element generating means for reading the character string and the piece of image information from the document storing means and converting the character string and the piece of image information into respective display image elements, wherein the display image elements are bit-mapped graphics;

supplementary design adding means for reading a supplementary design corresponding to the piece of link destination information specifying the other document as the link destination from the supplementary design storing means and adding the supplementary design to a corresponding display image element in the bit-mapped graphics;

display link destination information converting means for converting the piece of link destination information specifying the other document as the link destination into a piece of display link destination information, the piece of display link destination information being related to a serial number corresponding to the supplementary design added by the supplementary design adding means, wherein the piece of display link destination information specifies, as a link destination, another display image; and

display image generating means for generating a video display image for the video display unit which is composed of the display image elements wherein the user can activate the remote controller to indicate selection of a specific supplementary design in the displayed video image to link to another display image that will be generated.

26. (Original) The data conversion system of claim 25, wherein the supplementary design storing means includes:

a maximum number storing unit for storing a maximum number of the supplementary designs in the display image, wherein the display image generating means further includes:

a display image generating unit for generating the display image by arranging the display image elements in the display image according to the display positions;

a maximum number judging unit for judging whether the number of the supplementary designs to be arranged in the display image exceeds a maximum number; and

a display image dividing unit for, when the maximum number judging unit judges that the number of the supplementary designs exceeds the maximum number, sending an instruction to the display image generating unit to divide the display image into a plurality of display sub-images so that supplementary designs less than the maximum number are added to each of the plurality of display sub-images divided from the display image, wherein the display image generating unit generates the plurality of display sub-images according to the instruction.

27. (Original) The data conversion system of claim 26, wherein:

the display link destination converting means further includes:

a display link destination sub-information generating unit for generating a plurality sets of pieces of display link destination sub-information which respectively correspond to the plurality of display sub-images generated by the display image generating unit.

28. (Cancelled)

~~28.~~ ~~29.~~ (Currently Amended) A data conversion apparatus for use in a data communication system which achieves pseudo interactive communications by using one-way communications from a data transmitting apparatus to a plurality of data receiving apparatuses, the data conversion apparatus comprising:

document storing means storing a plurality of documents each of which includes one or more character strings at least one of which contains a piece of link destination information specifying another document as a link destination;

display image element generating means for reading the character strings one at a time from the document storing means and converting each read character into a display image element being a bit-mapped graphic;

display image generating means for generating a display image which is composed of generated display image elements and is to be displayed on the plurality of data receiving apparatuses as one screen; and

identifier adding means for adding an identifier for cursor control to each generated display image element in the display image in accordance with display position of each display image element, the identifier for controlling cursor shifting between display image elements, including shifting to any desired display image element in the display image.

~~29~~ ~~30.~~ (New) The data conversion apparatus of Claim 29, wherein the identifier is a number.

31. (Cancelled)

32. (Cancelled)

~~30~~ 33. (Currently Amended) A data conversion apparatus for use in a data communication system which achieves pseudo interactive communications by using one-way communications from a data transmitting apparatus to a plurality of data receiving apparatuses, the data conversion apparatus comprising:

document storing means storing a plurality of documents each of which includes one or more character strings at least one of which contains a piece of link destination information specifying another document as a link destination;

display image element generating means for reading the character strings one at a time from the document storing means and converting each read character into a display image element being a bit-mapped graphic;

display image generating means for generating a display image which is composed of generated display image elements and is to be displayed on the plurality of data receiving apparatuses as one screen;

display link destination information converting means for converting each piece of link destination information into a piece of display link destination information which specifies, as a link destination, another display image which is a display image of the other document generated by the display image generating means,

wherein the document is written in HTML and the display image generating means determines categories of the display image elements from tags written in the document;

supplementary design storing means storing supplementary designs with serial numbers; and

supplementary design adding means for reading the supplementary designs from the supplementary design storing means one by one in order, and adding each read supplementary design to each piece of link destination information specifying the other document as the link destination, on a one-to-one basis, wherein

the display link destination information converting means converts each piece of link destination information into a piece of display link destination information corresponding to a serial number assigned to a supplementary design,

the supplementary design storing means includes:

a maximum number storing unit for storing a maximum number of the supplementary designs in the display image, wherein

the display image generating means further includes:

a maximum number judging unit for judging whether the number of the supplementary designs to be arranged in the display image exceeds the maximum number; and

a display image dividing unit for, when the maximum number judging unit judges that the number of the supplementary designs exceeds the maximum number, sending an instruction to the display image generating means to divide the display image into the plurality of display sub-images so that supplementary designs less than the maximum number are added to each of the plurality of display sub-images divided from the display image, wherein the display image generating unit generates the plurality of display sub-images according to the instruction.

31. 34. (Currently Amended) A data receiving apparatus for achieving a pseudo interactive communication by receiving one-way communications from a data transmitting apparatus, the data receiving apparatus comprising:

display means for displaying a display image which is composed of one or more display image elements which are each a bit-mapped graphic generated from a character string which is included in a document and contains a piece of link destination information specifying another document as a link destination, wherein an identifier for focus control has been added to each display image element in the display image;

storage means for storing information showing positions of the one or more display image elements displayed by the display means;

focus means for focusing on one of the one or more display image elements displayed by the display means;

reception means for receiving an operation signal of a move button on a remote control;
and

focus control means for controlling the focus and allowing another display image element to be focused on in accordance with either the identifier for focus control or the received operation signal by referring to the position information stored in the storage means.